ANALYSING BUSINESS MODELS FOR CROSS BORDER E-SERVICES PROVIDED BY THE CHAMBERS OF COMMERCE

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Abstract

The term "Business Model"started to gain momentum in the early rise of the new economy and it is currently used both in business practice and scientific research. Under a general point of view BMs are considered as a contact point among technology, organization and strategy used to describe how an organization gets value from technology and uses it as a source of competitive advantage. Recent contributions suggest to use ontologies to define a shareable conceptualization of BM. The aim of this study is to investigate the role of BM Ontologies as a conceptual tool for the cooperation of subjects interested in achieving a common goal and operating in complex and innovative environments. This is the case for example of those contexts characterized by the deployment of e-services from multiple service providers in cross border environments. Through an extensive literature review on BM we selected the most suitable conceptual tool and studied its application to the LD-CAST project during a participatory action research activity in order to analyse the BM design process of a new organisation based on the cooperation of service providers (the Chambers of Commerce from Italy, Romania, Poland and Bulgaria) with different needs, legal constraints and cultural background.

Keywords: BM, e-services, service provider, action research

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[1] LD-CAST (Local Development Cooperation Action Enabled by Semantic Technology) project (FP6-2004-IST) – http://www.ldcastproject.com

1 INTRODUCTION

The term "Business Model" (BM) became popular at the onset of the new economy and it is currently used both in business practice and scientific research (Alt and Zimmermann 2001). The term was initially used by start-up companies (Jouison 2005) and afterwards by every kind of organization: 27% of the Fortune 500 firms used the term in their Annual Report in 2005 (Shafer et al. 2005). As a result, BM related concepts were analysed by many disciplines, with different methodologies and objectives (Pateli and Giaglis 2004, Gordijn et al. 2005).

Previous research contributions tried to estimate the size of the phenomenon querying generic or thematic search engines (Seddon et al. 2004), using the results as an indirect dimension index and comparing trends with the NASDAQ stock exchange index, noticing similarities (Osterwalder 2004). Queried with the key "BM(s)", nowadays Google indexes 7.000.000 pages on this topic: in 2004 this number was equal to 1.000.000 (Seddon et al. 2004). Google Scholar, a more academic research-oriented search engine, produces instead 54.000 pages. More rigorous approaches use databases of peer reviewed journals to estimate the relevance of the phenomenon (Osterwalder et al. 2005).

Research on this topic is fragmented (Tikkanen et al. 2005). Authors prefer to start from scratch instead of relying on existing literature (Shafer et al. 2005): they do not share a common theoretical background, thus producing incompatible and sometimes mutually exclusive works (Pateli and Giaglis 2003, Pateli and Giaglis 2004). Nevertheless authors trace BM theoretical roots back to the tradition of the Transaction Cost Economy (Osterwalder et al. 2005, Tapscott et al. 2000, Amit and Zott 2001).

The term "BM" is commonly used to indicate different aspects of the same phenomenon: for an author, BM might refer only to a part of what it means to another author (Linder and Cantrell 2000). The term is often used independently from theory (Hedman and Kalling 2003). Existing definitions try to highlight different aspects: in literature there are abstract definitions of the BM concept (stating components and relationships), as well as implementation schemes of actual and virtual BMs that do not exist in the real world (Linder and Cantrell 2000, Osterwalder 2004).

Available definitions vary in structure and contents. There are synthetic definitions such as "*the organisation's core logic for creating value*" (Linder and Cantrell 2000), "*a story that explains how and enterprise works*" (Magretta 2002) or more simply "*the way we make money*" (Bienstock et al. 2002) as well as more structured definitions such as "*an architecture for the product, service and information flows, including the various business actors and their roles; a description of the potential benefits for the various business actors and a description of the sources of revenues*" (Timmers 1998).

Foreseeing the application of the BM concept to the LD-CAST research project, we here provide the definition of reference for the present contribution: "*A BM is a conceptual tool that contains a set of elements and their relationships and allows expressing a company's logic of earning money. It is a description of the value a company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital, in order to generate profitable and sustainable revenue streams*" (Osterwalder et al. 2005).

Trying to overcome problems highlighted in this area of interest, some contributions tried to summarize the existing literature defining BMs frameworks, classifications, typologies, taxonomies and ontologies (Bienstock et al. 2002, Gordijn and Tan 2005, Osterwalder et al. 2005, Pateli and Giaglis 2003, Shafer et al. 2005). In the past, the use of ontologies was restricted to philosophy-related research fields, but nowadays they are used as generic instruments and applied for the representation and exchange of knowledge (Guarino 1998). In the BM area ontology-based approaches were introduced with the BM Ontology (Osterwalder 2004) and the e3-value Ontology (Gordijn and Tan 2005, Gordijn et al. 2006). The two ontologies analyse the BM concept under two different points of view. The former focuses more on the internal structure of an organization, aiming at creating a common language among all the subjects interested. The latter is mainly interested in value exchanges among different organizations, aiming at providing a formal representation of BM related aspects such as value creation and exchange within an organization or a network. The issue of interoperability between the two approaches has recently emerged and has been faced by the authors (Gordijn et al. 2005, Pigneur et al. 2005).

The aim of this study is to investigate the role of BM Ontologies as a conceptual tool for the cooperation of subjects interested in achieving a common goal and operating in complex and innovative environments. This is the case for example of those contexts characterized by the deployment of e-services from multiple service providers in a cross border environment. To this aim, our empirical analysis focuses on the adoption of the BM Ontology (Osterwalder 2004) during the setup process of a new organisation based on the cooperation of service providers (the Chambers of Commerce from Italy, Romania, Poland and Bulgaria) with different needs, legal constraints and cultural background.

2 RESEARCH METHODOLOGY

In order to apply the concept of BM to a collaborative environment and to study its benefits, we decided to clarify the underpinning ontological and epistemological assumptions on which the BMs concept is based. For this purpose we carried out a literature review on research contributions centred on BM conceptualization already started in a previous work (Braccini and Spagnoletti 2008). Methodologies used for the literature review are explained in § 2.1 while § 2.2 describes the methodology used for the application of the BM concept to the real context.

2.1 Literature review

In order to collect relevant literature centred on BMs, we adopted an approach already used in similar past research, consisting in querying the Business Source Premier database of scholarly peer reviewed journals (Oserwalder 2004, Osterwalder et al. 2005, Nagle and Golden 2007). This database contains more than 8000 journals covering management, finance, accountability, administration and economics. Our literature review was mainly based on journal articles in order to examine research contributions already subjected to a rigorous peer review cycle.

The full text search, using "Business Model(s)" as a search key, restricting the time interval to papers published since 1990 till now, produced more than 6.000 results, while the abstract search with the same parameters produced about 1.100 papers. Comparing these numbers with those available in (Osterwalder 2004) enables us to provide a more rigorous dimension of the interest area on BM. In 2003 the same search produced 3.000 papers for the full text and 500 for the abstract.

Some contributions including the term "Business Model(s)" in the full text are simply referring to it while others pay much more attention to this concept; in the present review, we decided to give priority to the latter group. Assuming that papers mentioning the term in the title and the abstract are more specific to the topic, we searched the database using these fields to obtain two sets of results: 210 papers containing the term in the title and 108 containing it in keywords. These two sets were affected by a certain overlap as sometimes the same paper was included in both sets. This overlap was eliminated through the creation of a single set to avoid duplicated results; this set was composed of 261 papers. Analysing these papers, the term "BM" was found to be used in highly diversified contexts. Among all selected research contributions, only 79 seemed to be strictly related to the BM research interest area. Within this restricted sample, only the most relevant works were selected, including others not available in the set which were identified by analysing references. The final set was composed of 55 papers.

To identify disciplines interested in the BM research fields, selected research contributions in thematic areas were classified on the basis of the journals main topics. Papers classified in the "Other" category belonged to areas which had only one occurrence in the set. We also traced the definitions provided by the authors and their position in the BM research area, distinguishing between isolationists approaches (trying to highlight application limits of each position) and integrationists approaches (trying to summarize all the positions stated around a certain topic).

Furthermore, since contributions in literature belong to different disciplines and approaches, we used the Burrell and Morgan's framework as an intellectual map to analyse sociological and philosophical concerns in selected contributions and to depict the conceptual basis and the underpinning philosophical assumptions of the selected literature (Burrell and Morgan 1979). Discussions about the validity and legitimacy of this framework are out of the scope of this paper and can be found in literature (Dhillon and Backhouse 2001).

2.2 Participatory action research

The empirical part of this study is based on a three year participative action research project started in January 2006 in the context of an EU project (LD-CAST) which aims at enabling the cooperation among the Chambers of Commerce from different countries to provide traditional and new services, based on semantic technologies and service-oriented architectures. Since the beginning of the project we participated to the activities for the definition of a suitable exploitation plan. Data collected are based on the analysis of the project documentation (i.e. proposals, meeting minutes, review reports, project deliverables and so on) and on direct interactions with the project partners during teleconferences, mail exchanges, face to face meetings and other events in which we were actively involved.

In action research projects, researchers usually collaborate with practitioners to solve practical problems while expanding their scientific knowledge (Jönsson 1991, Baskerville & Myers 2004). Citing Blum (1955), Baskerville and Myers (2004, p. 330) argue that action research is a two-stage process: "First, the diagnostic stage involves a collaborative analysis of the social situation by the researcher and the subjects of the research. Theories are formulated concerning the nature of the research domain. Second, the therapeutic stage involves collaborative change. In this stage, changes are introduced and effects studied". The two outcomes are the action taken to solve the problem and the generation of research findings that inform theory (McKay and Marshall, 2001). Participatory action research extends traditional action research approaches (Baskerville 1999). In participatory action research the responsibility for theorizing is attributed both to practitioners and researchers; practitioners have the status of "co-researchers" as they "bring situated, practical theory into the action

research process" (Baskerville 1999, p. 17). This is very much the case of our study, where "practical theory" of the Chambers of Commerce was matched with that of our research team.

3 UNDERPINNING ASSUMPTIONS IN BM RESEARCH

Results of the literature review are shown in Table 1. The columns indicate, in the given order:

- thematic area;
- number of papers in the area;
- number of isolationists papers;
- number of integrationists papers;
- number of macro definitions of BM;
- number of micro definitions of BM;
- number of papers without a proper definition of BM.

The "micro" definition describes components, interactions or relationships among the elements of a BM while the "macro" definition does not have any structure and it is formed by one or more sentences only, synthetically describing what a BM is. We assume that a macro definition is less precise than a micro.

These results clearly show that there are many areas interested in BM research, proving that interdisciplinarity is a main building block of this research.

The "Total" row at the bottom of the table indicates that isolationists approaches are prevalent. This consideration is also supported by the number of definitions provided. The last three columns show that 40% of the selected works do not provide a proper definition of the term and that macro definitions prevails among the others. Table 1 shows that Management is the most interested area in BM research and that E-Commerce, Information Systems, Business and Technology also pay particular attention to this topic.

Area	No.	Isolationists	Integrationists	Macro	Micro	None
Management	13	11	2	2	5	6
E-Commerce	7	1	6	4	1	2
Information Systems	5	1	4	1	3	1
Business	5	1	4	3	1	1

Technology	5	5	-	2	-	3
Organization	4	3	1	1	1	2
Computer Science	4	4	-	-	1	3
Finance	3	3	-	1	-	2
Strategy	3	2	1	1	2	-
Economics	2	2	-	2	-	-
Other	4	4	-	1	1	2
Total	55	37	18	18	15	22

Table 1. Paper classification

The relevance of the meaning of the BM is not so much perceived as worthwhile in the Management field, where the majority of contributions are isolationists and the term is commonly used as a generic synonym for strategy (Betz 2002, Karin 2004, Voelpel et al. 2005, Wells 2004). Among the selected papers, micro definitions are dominant. Isolationism prevalence in almost 50% of the cases let us argue that, in this field, authors are not aware of the interdisciplinary aspects of the BM research.

In the E-Commerce field, integrationists approaches are predominant, but as we come to analyse the definitions provided, macro definitions are predominant: "*we are confronted with an understanding of BMs that often remains unspecific and implicit*" (Alt and Zimmermann 2001).

In the Information Systems field, the need to share a common theoretical base is clearly emphasized by authors. In this area, researchers try to clarify the relationship between BM and Strategy (Hedman and Kalling 2003, Seddon et al. 2004) in order to develop a more rigorous definition of the term with the adoption of an ontology (Osterwalder et al. 2005) and to classify and organize the relevant past literature to facilitate progress in the research (Pateli and Giaglis, 2004). Usually, the motivation underlying these contributions is strongly linked to the IS/Strategy alignment topic.

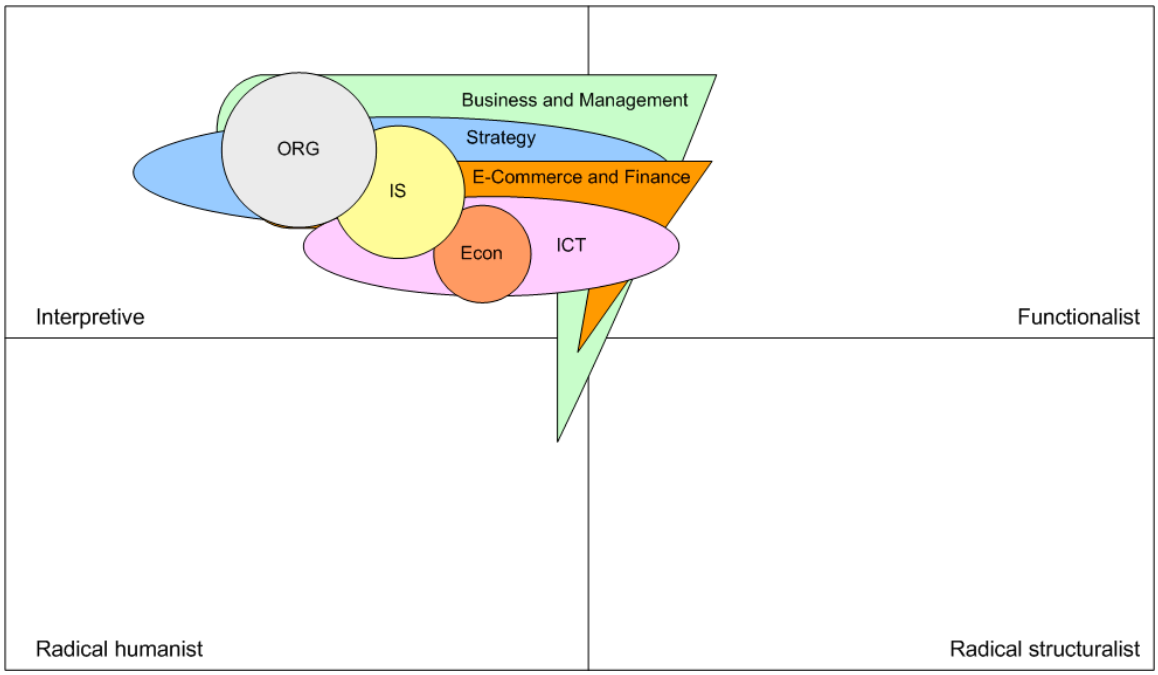
In the Business area, contributions aim at clarifying different aspects of the BM research by defining the relationship between strategy and BM (Mansfield and Fourie 2004) and identifying BM components (Dubosson-Torbay et al. 2004, Shafer et al. 2005).

Other areas are mainly isolationist and use the term BM in a generic manner, assuming its meaning is known. Some of the other areas do not share the same research object as the BM is referred to an organization, a network, an industry or an economy (Fisken and Rutherford 2002, Nosella et al. 2004, Feng et al. 2001).

To obtain further information on collected papers and in order to able to compare contributions produced by different disciplines with different approaches, we used the Burrell and Morgan's framework as an intellectual map to analyse socio-philosophical concerns in selected contributions and

to depict the conceptual basis and the underpinning philosophical assumptions of the selected literature (Burrell and Morgan 1979). Discussions about the validity and legitimacy of this framework are out of the scope of this paper and can be found in literature (Dhillon and Backhouse 2001).

Results are shown in Figure 1. To increase readability and considering that some areas share the same position on the map, we created the following categories: E-commerce and Finance, Business and Management, and ICT (formed by Computer Science and Technology). Shape and dimension of areas



reflect the position of the papers in which they have been classified.

Figure. 1. Classification with Burrell and Morgan's framework

The matrix clearly shows the prevalence of the interpretive paradigm in BMs research. Even though BMs were studied by different disciplines using different perspectives, the great majority of contributions share a common ontological and epistemological approach. With these premises, the research on BMs seems to follow a common path. The prevalence of the interpretive paradigm is typical of new and not well-known fields: this seems to fit perfectly with BMs research.

The prevalence of the interpretive paradigm might explain the isolationism prevalence. If contributions on BMs are mainly based on interpretations, it might be hard to find a common path because interpretations rely on subjective judgments and subjective judgments can easily diverge.

Moreover, this research field seems to lack an objective perception of reality. Objective perception derives rational explanations from observation and measurement and defines general laws in order to predict or evaluate (Orlikowsky and Baroudi 1991). Anyhow this is mainly linked to a limitation of the Burrell and Morgan's framework which confronts only objectivism vs. subjectivism. If we think

about BMs in terms of constructionism, rather than only in terms of objectivism or subjectivism, we move from the object to the meaning. In terms of meaning, we no longer talk about "valid" or "invalid" interpretations but rather about "useful" or "useless" ones, able or not to perform a specific scope (Crotty 1998). It is in this perspective that the present work applies the BM concept to a real context.

4 THE LD-CAST PROJECT CASE

The LD-CAST project, funded by the EC under the 6th Framework Programme, aims at enabling cross border cooperation between the European Chambers of Commerce towards the more general objective of supporting the development of private company initiatives. With this aim and in accordance with the European Interoperability Framework (EIF) guidelines, the project partners defined a cooperation framework methodology and developed a prototype platform based on the use of innovative semantic technologies and service-oriented architectures. The project consortium is made up of universities and research institutes which are mainly involved in the definition of the ontologies and process models, of IT partners for the development of the prototype and of the Chambers of Commerce in four EU member states (Bulgaria, Italy, Poland and Romania) acting as service providers and supporting the definition of the processes and services to be addressed.

4.1 LD-CAST Project Exploitation Issues

Among the quantifiable objectives of the project, the definition of an effective exploitation plan was considered a key issue since the beginning of the project both by the Project Officer and reviewers, by the EU Commission, and by all project partners. As a matter of fact, the project proposal states that:

"The research will produce an exploitation plan containing 1) a detailed description of the exploitable results; 2) the addressed markets, with an analysis of the potential market and possible penetration; 3) sales strategy, including an analysis of how products and services shall be proposed and sold to potential prospects (direct vs. indirect channels, packaging of products, licences vs. ASP models, ...); 4) the consequent overall and individual exploitation plan."

During the project, the Chambers of Commerce (and through them, the enterprises they represent) played a key role: they were actively involved in the validation of the exploitation plan, by taking part to the process of submitting results to the Chambers of Commerce officials, business consultants, business analysts, business associations and entrepreneurs. The most successful aspect of the project was the active participation of players mostly involved in business episodes and, as a consequence, in the possible exploitation of results.

The main exploitation capabilities of the LD-CAST project rely on the possibility to market and sell automated or semi-automated service provisioning applications. The marketing targets of the LD-CAST project are public or private organisations supplying services to companies, mainly to SMEs, by means of call centres, interactive information portals and direct interaction with visiting customers. Among such organisations the Chambers of Commerce (CCs) play a major role.

Typical SMEs are too small to have at their disposal all the internal procedural and legal competences required to extend their business beyond country borders. For this reason, they need to rely on services provided either by individual consultants or by organisations specifically devoted to support SMEs in such efforts. CCs (and similar organisations) can make profit by including the offer related to accessing LD-CAST service portals to their customers (i.e. mainly SMEs) as part of the additional services that CCs (or similar organisations) normally provide to SMEs either on a pay-per-use basis or included in their annual enrolment fees as an optional package.

With these premises the LD-CAST BM definition process represents an interesting phenomenon to investigate in order to better understand the possible advantages of an ontology-based BM used as a conceptual tool to analyze emerging scenarios. Indeed, the cross-border character of the new services provided, the differences between legal constraints, cultural background and the innovative technologies involved require an accurate analysis of several aspects, representing an interesting empirical case on which our research proposition can be verified.

4.2 The LD-CAST BM definition process

During the first phase of the project, a detailed analysis of the "as is" scenario was performed, and a number of issues arose in terms of diversity between organizational contexts in each country. Starting from the four pillars of the BM Ontology (Osterwalder 2004) as a conceptual lens to analyse the exploitation issues, it was observed that despite a common agreement among partners on the LD-CAST main value proposition, other areas such as the definition of customer interfaces, infrastructure management and financial aspects required a deeper understanding for each involved partner. Therefore a deeper analysis was needed in order to understand the multiple contexts involved and to find an agreement to define different strategies at a local level.

First and foremost, every Chamber of Commerce agreed on the fact that the main value proposition was the "offering of day-to-day services enhancing and catalyzing cross-border business ventures by providing services mostly supporting businesses in completing bureaucratic procedures quickly and accurately". This was useful in the identification of a first set of services to be provided through the new platform (i.e. search of trustworthy partners, company legal verification, company fiscal

verification, technical and quality standard verification, etc.). Moreover, further services are planned to be implemented in the future.

Second, the first exploitation issues arose with reference to customer interface in terms of who are the target customers of the LD-CAST project, how it plans to provide products and services, and how it intends to build a strong relationship with them. Not all customer segments apply to all national markets in the same way. For example, even if the most suitable targets seem to be individual businesses and entrepreneurs, the overall target segmentation is different in each country and the following positions are covered by aspiring entrepreneurs and students in Italy, business consultants in Poland and Bulgaria and professional associations in Romania.

Third, in the infrastructure management area, the Chambers of Commerce need to define (i) how LD-CAST will effectively manage infrastructural and logical issues, (ii) the partners they intend to do business with and (iii) the kind of enterprises/bodies involved. This area describes the value system configuration necessary to deliver services and maintain customer interface, including the activities to create and deliver services, the capabilities (in-house or involving an outside actor) and the partnership network. Also in this case there are national differences mainly due to the statutory differences among the Chambers (voluntary or mandatory membership) and to the relationship with other national service providers. For instance, the Italian case is quite different from the others due to the fact that the Chamber of Commerce is a public body and membership is mandatory for all businesses.

Finally, from the financial point of view, the revenue model was taken into account by looking at the differences of cost structures due, for example, to the maturity level of technologies supporting services and to the effectiveness and efficiency of existing processes.

Figure 2 shows the four pillars and the nine building blocks of the BMO (Business Model Ontology) with a set of numbers representing the order by which data were collected and analysed during the LD-CAST project.

The resulting LD-CAST BM was built upon the concept of LD-CAST Local agency, the “virtual” point-of-sale of LD-CAST services, which corresponds to an interoperable one-stop business portal run (directly or indirectly) by one of the above mentioned organisations. All the building blocks of the BM Ontology were analyzed in order to figure out the time frame of a return on investment and a cost-revenues projection over the next two to five years after the end of the project. Data were collected from each country through a direct interaction with targeted users; customer data were stored for a certain period of time and were analyzed on the basis of the kind of product, geographical location, etc.

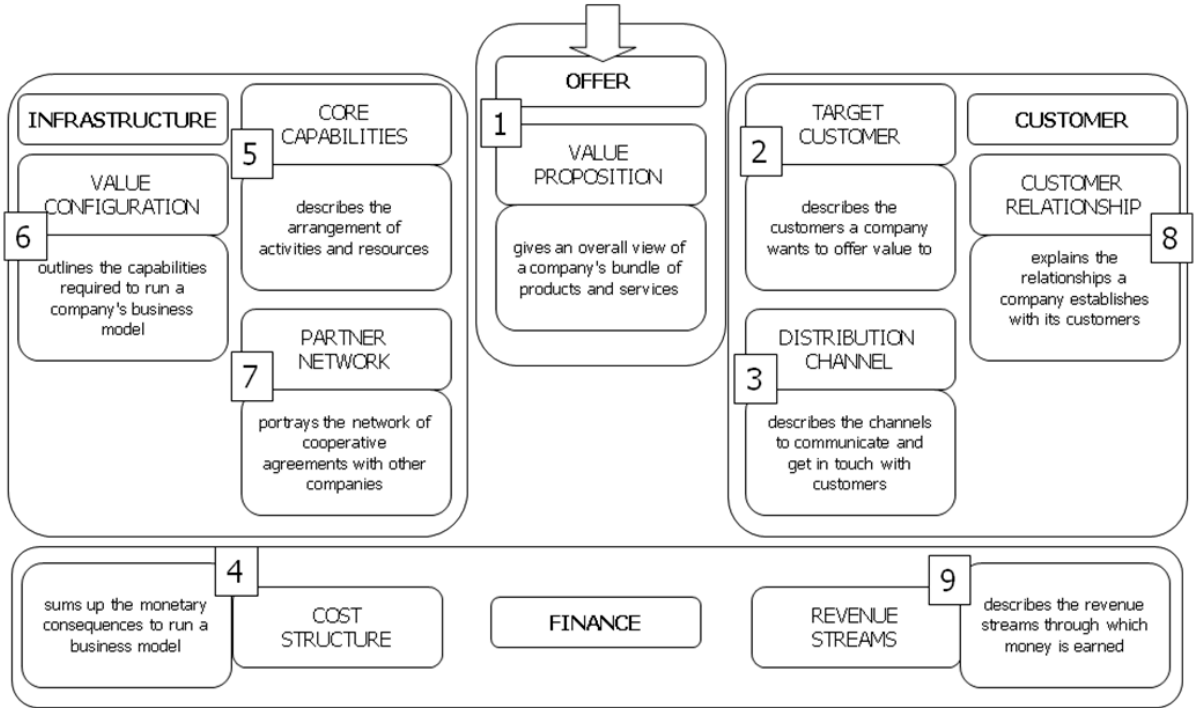


Figure 2. LD-CAST BM bird eye view, based on BMO (Osterwalder 2004)

4.3 The LD-CAST BM definition process: an example

This paragraph describes how the Business Model Ontology has contributed to the definition of the LD-CAST BM. The ontology schema was used as a guide for interviews or surveys among partners. The definition process required several interactions among partners and it was carried out in the WP 8.1 “Dissemination and Exploitation” which covers the whole duration of the project and deals with BM-related concepts during the last year of the project.

As indicated in the previous paragraph and in Figure 2, the value proposition represented the starting point as all the partners involved agreed to consider it as the core of the BM. A number of services (offerings) that could be offered via the LD-CAST platform was defined as a set of individual services offered by the Chambers of Commerce in the four countries. Services included are mainly traditional services provided by the CCs (such as company legal verification, company fiscal verification, fiscal information and the like). In the BMO, each offering element is linked to other components; this paragraph will provide an example of a single service: “Company fiscal verification”.

Having defined a set of possible services, the following step was the definition of the target customer. LD-CAST project partners used four different profiles of traditional Chambers of Commerce customers: individual businesses, business consultants, professional associations and the Chambers of Commerce as well. For each offering element, the partners defined the customers that might be

interested in it. In the case of the present example, the “Company fiscal verification” service was offered to only three target customers: individual businesses, professional associations and CCs. During this step, some figures were also calculated to estimate LD-CAST market size.

Other customer-related BM components are the Distribution Channel and the Customer Relationship. The main LD-CAST distribution channel is the LD-CAST platform itself (as it is used to deliver services). Thinking of a way to reach more customers, the partners indicated different ways to let customer access to the LD-CAST platform (for example, portals or vortals, desk services in the Chamber of Commerce, local development agencies). Partners indicated different links to reach customers, but they did not indicate actors involved in this link (as required by the BMO).

The next step in the definition process was mainly linked to the definition of the BM infrastructure. Partners defined Core Capabilities as a set of general capabilities necessary for LD-CAST to run the BM (for example: supply chain excellence, maintenance of cheap services providing platform, trustability in partner search). Resources were indicated by partners in combination with the Value Configuration and were divided into the following groups: human resources (partners required 13 units, ranging from the CEO to the technical staff, as the basic need for the LD-CAST agency), tangible resources (office, furniture, PCs, servers, internet connection, telephones, fax machine, software and others) and intangible resources (agreement with local service providers, training, contract for services provision and others). Partners did not define activities in the Value Configuration as they were deeply discussed and described in a previous phase of the project.

Finance was the last issue faced in the BM definition process. The BMO requires a clear definition of Costs and Revenues of the proposed BM. While other elements in the BMO are linked by different relations, finance is a general element and only revenues are linked to target customers. As a matter of fact, partners found more convenient to define BM economics using the traditional Business Plan. Partners indicated a set of costs that are (probably) beyond the scope of the BM, as they indicated the initial design and development costs, technological infrastructure costs, maintenance evolution costs, marketing and cost of sales deriving a total cost estimation for five years. As for Revenues, partners were involved in the definition of possible revenue strategies as well as a possible break even point analysis. At this stage, they have not defined pricing policies yet, but they formulated a few hypotheses to calculate the break even point. As a result, finance became the most developed part of the BM, but even the most far from the BMO as in this phase ontology was not used. It is interesting to notice that costs and revenues in the BMO are the less integrated components in the rest of the BM. Probably costs and revenues do not require too much effort to be understood by stakeholders or, under a different point of view, it is quite difficult to link each item (especially on the basis of costs) to other items in the BMO.

5 DISCUSSION AND CONCLUSIONS

Given the great fragmentation of the BM research, in this paper we applied the BM Ontology to a real context, being one of the most comprehensive conceptual tool used for Business Modelling. Our results indicate that structure and relationships among BMO components contributed to the BM definition process in a highly complex environment. This complexity was mainly due to differences in terms of market needs, organizational structure and legal frameworks among partners willing to cooperate by means of e-services in a cross-border environment.

Having observed the adoption of the BM Ontology for almost two years in a participatory action research project, we can validate its usefulness as a communicative tool among stakeholders involved in a collaborative business environment. This approach can provide an effective communication channel among involved subjects when e-services are deployed by users with different needs, legal constraints and cultural background. As mentioned in § 4.3, in the LD-CAST BM definition process, the BMO was not always slavishly followed. Considered that ontology is defined by four pillars, on which nine building blocks are based, each one composed by further atomistic elements, all of these linked to each other, this experience shows that the LD-CAST project may serve as a communicative tool, even if it is used by focusing only on some of its layers. The sequence adopted to apply the ontology to the project is different from the one suggested by the author (Osterwalder 2004), but considering that each element is dependent on the others, sequence is not important. We can finally argue that in the use of the BMO as a communicative tool in a BM definition process, the main role is not only played by the definition of BM components, but mainly by their relationships as they produce a path to be followed to define the BM which can be started from the most agreed item among the group of people involved in the task.

Validation of the ontology as a communicative tool was already tested in previous research (Nagle and Golden 2007). Anyhow, our study differs from these previous studies given its ex-ante perspective and duration. Observation results support our research proposition by recognizing to more structured forms of BM conceptualization the role of supporting tool for the development of exploitation strategies when new IT based services are deployed. Without the adoption of the ontology as a shared concept of BM, practitioners would be facing confusion and diversity of meaning of the term as shown in our literature review.

Finally, the duration of the participatory action research activity, covering all project phases before end users validation (entrepreneurs), could be a partial limitation to our consideration. Even if we observed the application of the ontology for two years in many contexts and in highly complex environments, further research should be addressed to investigate the effectiveness of the defined BM.

As the BM concept emerge as a link among technology, strategy and organization, a proper validation of the derived BM could be obtained facing the customer and the market. Plus this could be particularly useful to answer the issue raised at the end of our literature review, dealing with the risk of BM Ontology incompleteness.

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